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AUTHOR Cubberley, Carol W.
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ABSTRACT

This report describes a study of the use of science and technology books and journals in an academic library which was conducted to ascertain whether journal use can be predicted by book circulation figures. The study background and significance are discussed, terms are defined, study limitations are considered, and basic assumptions are explained. A discussion of data collection procedures describes the determination of the number of uses of books and journals per week during a 12-week period, which was done by recording circulation figures reported by the CLSI automated circulation system for books, and by counting the bound journal volumes as they were reshelfed. The average number of uses per journal title was then compared to the stress figure for book circulation in specific subject classifications. An analysis of data using the Spearman rank order technique indicated a moderately high positive correlation between book stress and journal use, and it was concluded that it would be feasible for librarians to use book circulation data to determine the most heavily used areas of the collections, and use this information in the selection process for journals. Further studies such as a parallel count of the use of journal volumes on microform and a use survey of unbound and current volumes are also suggested. Rankings of stress and use are presented in tabular form, and the correlation between book stress and journal use is depicted in a graph. Two references are provided. (KM)

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AN INVESTIGATION INTO THE CORRELATION BETWEEN BOOK
CIRCULATION AND JOURNAL USE IN THE SCIENCE AND
TECHNOLOGY SECTION OF AN ACADEMIC LIBRARY

Carol Cubberley, M.L.S., D.A.I.S.

University of Central Florida

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A practicum report submitted in partial fulfillment
of the requirements for the Degree of
Doctor of Arts in Information Science
Nova University

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AUTHOR ABSTRACT

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Abstract

At a time when the cost of library materials is increasing and available funds are decreasing, librarians must find ways to provide needed materials for library users. In an academic library with a historical emphasis on science and technology, circulation figures showed heavy use of books in the sciences. Since scientists are assumed to rely more heavily on journals than on books, a use study of science journals was conducted. Correlation between use of books and use of journals was found to be significant. This knowledge will be used to aid librarians in the allocation of funds for journal subscriptions. Easily obtained book circulation figures will be used to identify areas of the collection receiving heavy use. Subscriptions for journals will be entered in these heavily used areas.

Information About Document

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ABSTRACT

At a time when the cost of library materials is increasing and available funds are decreasing, librarians must find ways to provide needed materials for library users. In an academic library with a historical emphasis on science and technology, circulation figures showed heavy use of books in the sciences. Since scientists are assumed to rely more heavily on journals than on books, a use study of science journals was conducted. Correlation between use of books and use of journals was found to be significant. This knowledge will be used to aid librarians in the allocation of funds for journal subscriptions. Easily obtained book circulation figures will be used to identify areas of the collection receiving heavy use. Subscriptions for journals will be entered in these heavily used areas.

Introduction

Academic librarians struggle continually over problems connected with journals. Two perennial questions are: how much money should be spent and how many titles should be provided for individual disciplines? Although formulas abound and multiply for allocating book funds, very little guidance is available for journal allocations. Some libraries may spend as much as 75% of their materials budget for journal subscriptions. Since the sciences are known to rely heavily on journal literature, the preponderance of these subscriptions may be in the sciences, and science journals are notoriously more costly than journals in the humanities or social sciences.

In the library of a university that had started life as a technical university and recently added liberal arts, a study of book use compared to collection size had revealed that technical areas of the collection, although generally assumed to be strong, were experiencing such heavy use as to be under stress. For instance, the classification containing books on computer science represents 12.44% of the collection. This section experienced, over a year, 22% of the circulation. Many areas of technology and some social sciences exhibited similar ratios. McGrath points out that when percent of circulation exceeds percent of collection size, such use justifies increased spending in the area (McGrath, 1975:359). Since scientists and science students rely more on journals than on books, then

one would expect the science journals in that library to experience heavy use.

It was decided to conduct a use study of journals in science and technology to ascertain if journal use could be predicted by book circulation figures. The study was the first in what will be a series designed to determine if journal use is heavier in sciences than in humanities and social sciences.

Research Hypothesis

The question to be answered as a result of the research conducted was: Is there a correlation between book circulation and journal use?

Background and Significance

In recent years, academic libraries have seen their budgets shrink while the cost and numbers of publications, particularly journals, rise annually. Librarians and faculty are beginning to accept the reality that even a research library can not provide all titles in a single field. Choices have to be made between disciplines and within disciplines.

A difficult area for these choices is in journal subscriptions. How heavily does a particular discipline rely on journals? How expensive are those journals? What titles contain most frequently cited articles? In short,

how does the librarian in charge of allocating funds decide how much to spend in each area?

A technique commonly used as an aid in making these decisions is the use study. Langlois, et al, mention photocopy requests, circulation figures, questionnaires, and reshelving as ways to measure use. Journals infrequently or never used may be candidates for cancellation. Sometimes use studies are used with citation studies or cost studies. When costs are considered, journals with high cost per use may be canceled (Langlois, 1973:242).

One problem with use studies used alone or with the factors mentioned above, is that while they can identify low use titles as well as titles heavily used, they do not suggest areas where more titles may be appropriate. A relationship between journal use and book use could be useful for identifying such areas. Circulation figures are more readily available in many libraries than are use studies of journals. When an area of the book collection is diagnosed as being stressed and in need of an extra allocation, that same subject area should be considered for new journal titles. If some principles for the relation of book and journal use could be established for all disciplines, then these principles could be applied in any academic library where circulation figures are available. This study is meant to be the first step in establishing such principles.

Definition of terms

In this study, academic library refers to a library in an institution of higher education. It includes libraries in colleges offering the Bachelor's Degree as the highest degree, and research libraries in institutions offering Doctoral Degrees and supporting research. Journals are scholarly publications issued serially under the same titles. Issues typically are paper and are numbered sequentially. Although academic libraries do provide some serial publications of a light nature, those identified as journals are serious. They support the curriculum, report the results of research, and provide a forum for scholars.

Sciences are the theoretical sciences, such as chemistry, physics, and math; and technology, or applied sciences, such as engineering, medicine, and computer science. They are the subjects falling in the Library of Congress classification schedules Q through T.

A book is said to circulate if it is charged out to a library user and taken from the library, or if a professor places it on reserve for course work. In-library use of books, and use of non-circulating items are not registered in circulation figures. In most academic libraries, journals and reference books are non-circulating.

Discipline refers to a discreet subject area such as computer science or biology. A use study is done by counting the number of times a title is used. A citation study is an analysis of journal articles cited in other

journal articles. A cost study is an analysis of the subscription costs of journals. More detailed cost studies include cost of processing, binding, and storing. Cost per use is ascertained by dividing the annual cost of a journal by the uses per year.

Areas of the collection are said to be stressed if use exceeds size. Stress is determined by dividing percent of circulation by percent of collection. Any result greater than 1.00 indicates stress (McGrath, 1975:365). In the computer science example cited above, circulation (22%) divided by collection size (12.44%) gives a stress figure of 1.77. The books in the nursing section are even more heavily stressed. Although accounting for only .44% of the collection, they represent 2.09% of the circulation, for a stress figure of 4.75. This section is severely stressed.

Limitations of the study

The automated circulation system that provides the circulation data has prescribed classification breakdowns not always specific enough. For instance, the OA classification can not be further analyzed. Yet this classification includes math, computer science, algebra, teaching methods in math, and fluid hydraulics. So when we learn that the OA class experiences stress, other investigations are needed to discover exactly where the stress occurs.

Circulation figures for books fail to record in-library

use. Journal use studies based on reshelving fail to record use by individuals who reshelve the journals in spite of signs asking that they not do so. McGrath, however, has studies indicating that in-library use parallels circulation, but recommends establishing this in each library and in each discipline (McGrath, 1975:367). Perhaps the only way to overcome this problem is to have closed stacks.

Use studies for journals were limited to Q through Z classes and to twelve weeks. All classes and a longer time period would be desirable, but was prohibited by limited staff and a planned move of the collection. Only bound journals were included in the study. Current and unbound issues are shelved alphabetically by title rather than by call number. Staff was not available to record use, especially using a different system of arrangement.

A serious shortcoming in the study was the failure to consider journals that are listed by title, but have no bound volumes on the shelf. These journals could receive use, but not have it recorded in a study of this type. They would be journals that are stored in microform rather than bound, or journals that have not yet been bound because they are too new, either as publications, or as part of the collection being studied.

Basic assumptions

It was assumed that most library use is by students and

faculty of the university and is in support of class assignments, class preparation, or research. As mentioned above, it was assumed that in-house use parallels recorded use. A study of in-house use would give added validity to any circulation figures used for fund allocation.

Procedures for collecting data

The CLSI automated circulation system records the call number of each item circulated. At the end of each month, number of items circulated for each broad classification is compiled and reported by the system. The size of the book collection in each broad classification has been measured in linear feet and reported by the stack supervisor.

Use of journals was counted by reshelving. The journals are shelved separately from books, and classes Q through Z are together on one floor. Each time a bound volume was reshelved, the shelver attached a colored dot to the shelf directly beneath the volume.

At the end of twelve weeks, number of uses under each volume of each title was recorded on the request sheet for that title. For the purposes of this study, it was decided to compare average number of uses per title to the stress figure for book circulation in each subject classification.

Rankings of Stress and Use

Class	Circ. Stress	Circ. Rank	Journ. Use	Journ. Rank
Q	0.44	6.0	3.55	22.0
QA	1.77	28.0	1.63	11.0
QB	0.42	4.5	0.71	2.0
QC	0.57	9.0	1.88	14.0
QD	0.27	1.0	2.39	16.0
QH	0.42	4.5	0.84	4.0
QK	0.34	3.0	0.56	1.0
QL	0.65	11.0	0.73	3.0
QP	0.54	8.0	2.24	15.0
QR	0.46	7.0	1.67	12.0
R	1.26	21.0	2.57	17.0
RA	1.62	25.0	3.09	18.0
RB	0.62	10.0	1.33	8.0
RC	1.59	24.0	5.41	29.0
RG	2.78	30.0	3.67	23.0
RJ	1.76	27.0	1.00	6.5
RM	1.25	20.0	3.25	20.0
RT	4.75	31.0	8.07	31.0
S	0.68	12.0	0.92	5.0
T	1.85	29.0	4.86	28.0
TA	1.24	19.0	1.50	9.0
TD	1.14	17.0	5.65	30.0
TH	1.68	26.0	1.00	6.5
TJ	1.10	16.0	1.53	10.0
TK	1.56	23.0	3.88	24.0
TL	1.03	15.0	4.10	25.0
TN	0.33	2.0	1.82	13.0
TP	1.00	13.5	3.54	21.0
TR	1.19	18.0	3.24	19.0
TS	1.27	22.0	4.70	26.0
TX	1.00	13.5	4.79	27.0

The resulting data were analyzed using the Spearman Rank Order technique to test the null hypothesis that there is no significant relationship between book circulation and journal use in the sciences. The Spearman revealed a moderately high positive correlation of .45, significant at the .05 level.

Scatter Plot Showing Correlation Between Book Stress and Journal Use



Significance of the Data

Because the initial findings indicate correlation, it would be worthwhile to conduct further studies, attempting to overcome some of the shortcomings of the present study. Most important would be a parallel count of use of journal volumes on microform. This takes on added importance when all backfiles of a title are on microform, and none are

available as bound volumes on the shelves. A use survey of unbound and current volumes also would be useful.

Until further studies are done, however, and more is known about the use of science journals in academic libraries, the librarians in this library may safely assume that if an area of the book collection is experiencing heavy use, then the journals in that area are also in demand. It would be appropriate to increase subscriptions in such areas. Moreover, if fund shortages arise, journals in the areas of low book circulation would be appropriate to consider for cancellation.

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